of a man whose fame could not permanently be lived down by jealous naval officers and disgruntled victors of the Civil War. Maury was not only the pathfinder of the seas, the founder of the United States Naval Academy, Naval Observatory, and Hydrographic Office, but was also the prime mover in laying the first trans-Atlantic cables, and an important factor leading to the founding of our national weather service. For his monumental work on the winds and currents of all the oceans he was recognized the world over as a very great benefactor. His charts shortened voyages by 10 to 20 per cent, saving to British commerce alone many millions of dollars a year. So highly regarded was he that at the outbreak of our Civil War Russia offered him an observatory, all the facilities he wanted, and $30,000 a year. But his sense of duty to Virginia called him from his scientific work to her service in the Civil War.

On Maury's part in the founding of our national weather service, the following passages from Caskie's biography are of interest:

> Early in the following year [1858], due to interest created by Maury's lectures and writings, eight cities, including Buffalo, memorialized Congress to "establish a general system of daily telegraphic reports on the wind and weather, for discussion at a central office" (p. 90).
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> In further substantiation of the claim that Matthew Fontaine Maury was the founder of the National Weather Bureau and Signal Service, the reader's attention is called to the speech of Mr. Vest, of Missouri, December 14, 1880, before the Forty-sixth Congress, third session. During the course of this address, Mr. Vest said:
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> "The whole signal-service system of this country originated with the Navy, not with the Army. The man who commenced it, in whose brain it first had existence, was M. F. Maury, In 1853 he instigated and brought about, by his own individual exertions, the assembling of a convention of scientists of the world at Brussels, to take into consideration a uniform system of meteorological observations. In 1857 I well recollect that Lieutenant Maury passed through the South and West, delivering lectures at his own individual expense to the people, urging upon them that they urge their members of Congress to establish a signal-service observation system for the Southern and Western States. If that had been done then, sir, millions of dollars would have been saved to the agricultural interests of this country.
>
> "This same man, by his system of research upon the ocean, by shortening the days of transit by means of his charts of the waves and of the winds, saved to the commerce of the world from forty to sixty millions annually, and he sought earnestly, by stirring up people, by writing and lecturing in the North and West and South up to the fall of 1860, and again after the war to within three months of his death, to put the same system into existence within the landed domain of the United States" (p. 108).

In his well-meant tribute to Maury's important part in the establishment of our weather service, Vest appears to have overlooked the contributions of Espy, Loomis, and Joseph Henry to the organization of a meteorological network on the land at the time Maury was so ably coordinating the data from the oceans. Cleveland Abbe, who, in 1869, actually began the forecasting service at Cincinnati that grew into the national weather service, presents the following items on the early history of our weather service:[3]

> 1847. December 8, Joseph Henry submitted his program of organization and work for the Smithsonian Institution, including first of all "a system of extended meteorological observations for solving the problem of American storms." [The Smithsonian Institution continued after this date a prominent factor in the development of meteorology in the United States.]
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> 1847. Espy and Loomis addressed letters to Prof. Joseph Henry, as Secretary of the Smithsonian Institution, urging the importance of the establishment of meteorological stations and reports for the study of American storms (p. 89).
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> 1854. Prof. Joseph Henry reported that the telegraph companies were furnishing the Smithsonian Institution with daily morning weather reports. He had suggested the custom, which became established, in accordance with which the first message each morning on opening any telegraph office was in answer to the salutation, "Good morning, what is the weather?" Each local operator gave to his division superintendent and the local newspapers a statement of these weather reports, viz, temperature, wind, and weather, and all of them were telegraphed to the Smithsonian Institution, where they were exhibited on a large wall map day after day during the years 1854–1861. These reports were frequently used by Professor Henry to predict or show the possibility of predicting storms and weather, a matter that he frequently urged on the attention of Congress. Espy and Henry were the prime movers in all matters of storm predictions both in this country and in Europe (p. 146).

As was indicated by Mr. Nunn in his biographical sketch of Maury, published in the January, 1928, BULLETIN, p. 7, Maury at his international conference in 1853 urged the establishment of meteorological networks over the lands particularly in the interest of the farmer. So, while Espy and Henry were talking most about storm predictions, Maury was hammering for "meteorology for the farmer" and "weather and crop reports." Their labors ultimately bore fruit, though sooner for the storm warnings than for the agricultural meteorology.—*Charles F. Brooks.*

A long wait for an adequate water supply.—Athens, Greece, celebrated on October 25, 1929, the completion of the Marathon Dam. This dam was erected on a site overlooking the immortal battlefield where in 490 B. C., the Greeks overcame the Persians. It was built to provide Athens with an adequate water supply and it was officially opened by the President of Greece, his cabinet, and other persons in Government circles. A sufficient water supply has always been a problem to the Greek capital as far back as to the time of Solon who, in 594 B. C., enacted laws governing its consumption. Three years ago Ulen & Co. of the United States signed a contract for the construction of the Marathon Dam and a new aqueduct tunnel 8½ miles through the base of Mount Pentelikon. The dam itself is the gravity-section arch type, faced up and down stream with Pentelikon marble of which the classic structures on the Acropolis were built.[1]—*A. J. H.*

Monthly Weather Review Supplement No. 32.—Climatological Data for Southern South America. Mr. Wesley W. Reed contributes under the above title his second statistical report on the climatic conditions of South America. The first report, Supplement No. 31, dealt with northern and western tropical South America. The present contribution presents the statistics with a discussion of the climates of the following countries: Uruguay, Paraguay, Argentine, and Chile, so that the two Supplements, 31 and 32, cover the continent of South America with the exception of Brazil.

The supplement can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. It is priced at 10 cents the copy.—*A. J. H.*

A solar laboratory.—There are several solar observatories, but the only institution in the world calling itself a "solar laboratory" has just been established at the University of Kentucky. In honor of the New York banker who endowed it, the new institution is known as the Percy H. Johnston Solar Laboratory.

Though striking progress has been made in recent years in the knowledge and control of "indoor weather," it appears that one important element has been neglected. We know that certain combinations of air temperature, humidity, and wind are conducive to comfort. The American Society of Heating and Ventilating Engineers has published a number of "comfort charts" for the

[1] Condensed from Hydraulic Engineering, Los Angeles, December, 1929.

[3] Chronological outline of the history of meteorology in the United States. MO. WEA. REV., 1909, vol. 37, pp. 87–89, 146–149, 178–180, 252–253.

guidance of those who design and install ventilating and air-conditioning systems. These charts show the values of the elements above mentioned that, in combination, are most comfortable for persons stripped to the waist, fully clothed, idle, slightly or actively employed, etc. The same society and other agencies have learned much about atmospheric pollution and means of reducing it.

The element that still needs more intelligent regulation is light. The new laboratory is designed especially to study the effects of light on animal and plant life. It is an 8-room building, equipped with the latest types of air-conditioning apparatus. Daylight is admitted through a glass roof, but there are also devices for providing various kinds of artificial light, and the program of investigations is much broader than the title of the laboratory indicates. The director is F. P. Anderson, dean of the College of Engineering at Kentucky University.—*C. F. Talman.*

Empirical factors in weather forecasting.[1]—The Meteorological Office always welcomes friendly and constructive criticism, and therefore it gives me much pleasure to reply to the points raised by Mr. Wilfred Trotter in his letter published in Nature of October 19. Mr. Trotter's main indictment is that modern British forecasts prepared on synoptic charts take too much account of the pressure systems shown on those charts and too little of that general tendency for persistence of weather which sometimes seems to cause fine weather to continue for a long unbroken spell with little regard to the pressure distribution. It would be idle to deny that there may be some truth in this charge, but perhaps I may point out some of the difficulties with which the forecaster is faced. Let us take as an example a case which was fairly common during last summer, when a trough of low pressure over Ireland, stretching down from an Icelandic depression, is moving eastward across the British Isles and probably already giving some rain in Ireland. The question to be answered is, Will this rain spread to the south and southeast of England? The forecaster knows from his experience that in normal circumstances it will generally do so. In the particular type of weather which we are discussing he also knows that the past month or past few months have been abnormally dry. There are these two conflicting elements to be balanced. If he leaves out rain and it comes, he fails in what to many people is the most important factor of his forecast. He decides that he can not take this risk with no better grounds for the omission than the somewhat nebulous one that the summer has so far happened to be abnormally dry. He therefore indicates the probability of some rain; when he comes to the office the next day and reviews the situation, he may wish that he had taken the risk and left out the reference to rain. It is easy to be wise after the event. It must be remembered that, even in a dry summer like the past, there have been days when troughs of low pressure have given rain in the south of England, so that if the forecaster had omitted to mention it on every occasion, he would in some cases have been wrong, and badly wrong.

There is a further point. The Meteorological Office has to forecast for the whole of the British Isles, and it happens that drought in one part of the country coincides with excessive rain in another part. We have been taken to task already this summer for not making enough mention of heavy rains which fell in the West Highlands of Scotland. The forecaster, therefore, who is looking at the whole of the country may not have the dryness of the season impressed upon him quite so strongly as members of the public who see the weather in their own locality only, and from the nature of the case take little account of that in other areas. We have been aware of this tendency to forecast rain more frequently than the event proves to be necessary in dry spells for many years, and if we have failed to benefit by experience, this is due more to the difficulty which I have tried to indicate above than to ignorance of the facts. The cure will be found in more science, not less. When we really understand the workings of the atmosphere and have enough upper air observations to tell us what is happening at the time, we shall know that the particular trough which is approaching can not bring rain; but that time has not arrived yet.

One further criticism is made by Mr. Trotter, and that is with regard to the forecasting of summer thunderstorms, his charge being that too little account is taken of the time of year and that thunderstorms are forecast as confidently in the latter part of August, or even in September, as in the middle of July when the thunderstorm season is at its height. The forecasting of thunderstorms is perhaps the branch into which more scientific method has been introduced than into any other branch of forecasting, and much account is now taken of whether the upper air conditions, as shown by airplane ascents, are stable or unstable. Nevertheless, these observations are not always available when required, and then the older methods of forecasting by pressure distribution and surface temperature have to be used exclusively.

I have not statistics available to show whether Mr. Trotter is right in thinking that the trustworthiness of the forecasts of thunder declines steadily throughout August. The average number of days of thunder at Kew Observatory in August is equal to that in July, and higher than in any other month of the year, though the September figures show a sharp drop. Recent criticisms of our forecasts have suggested that we forecast thunder too often throughout the whole summer, and I believe that this is largely due to the fact that any individual observer is concerned only with the thunder in his immediate vicinity, whereas our forecasts cover a whole district. If a thunderstorm is likely in any part of that district, we do not feel justified in omitting it from the forecast. The number of days in an average summer when thunder is reported at a few isolated places but by no means generally over a district is very considerable.—*J. S. Dines.*

[1] Reprinted from Nature Nov. 9, 1929.